CLAIMS

What is claimed is:

1. An apparatus for a voice user interface with personality, the apparatus comprising:

logic that provides a voice user interface, the voice user interface outputting first voice signals, and the voice user interface recognizing speech signals; and

logic that provides a personality, the logic that provides the personality interfacing with the logic that provides the voice user interface to provide the voice user interface with personality.

2. The apparatus as recited in Claim 1 wherein the logic that provides the voice user interface and the logic that provides the personality comprise computer software stored in a memory of a computer system, the computer software being executed on a processor of the computer system.

3. The apparatus as recited in Claim 2 wherein the computer system comprises a microphone and speaker, the speech signals being received from the microphone, and the first voice signals being transmitted to the speaker.

4. The apparatus as recited in Claim 2 wherein the computer system is in communication with a telephone, the speech signals being received from the telephone, and the first voice signals being transmitted to the telephone.

5. The apparatus as recited in Claim 2 wherein the computer system comprises at least two computers.

6. The apparatus as recited in Claim 1 wherein the voice user interface with personality comprises a virtual assistant with personality.

7. The apparatus as recited in Claim 6 wherein the personality of the virtual assistant comprises a predetermined tone or cadence of the first voice signals, a predetermined vocabulary, a predetermined

sentence construction, or a predetermined degree of assertiveness.

8. The apparatus as recited in Claim 6 wherein the first voice signals comprise a prompt, the prompt being scripted for the personality of the virtual assistant.

9. The apparatus as recited in Claim 6 wherein the first voice signals comprise a recorded prompt, the recorded prompt being acted and recorded for the personality of the virtual assistant.

10. The apparatus as recited in Claim 1 wherein the logic that provides the personality comprises randomly selecting a prompt from multiple prompts available to provide a predetermined response.

11. The apparatus as recited in Claim 1 wherein the logic that provides the personality comprises selecting a prompt, the prompt comprising an appropriate temporal prompt.

12. The apparatus as recited in Claim 1 wherein the logic that provides the personality comprises selecting a prompt, the prompt comprising a term that was previously spoken by the user in a recognized command.

13. The apparatus as recited in Claim 1 wherein the logic that provides the voice user interface comprises recognizing multiple spoken commands as a predetermined command.

14. The apparatus as recited in Claim 1 wherein the logic that provides the voice user interface comprises generating second voice signals, the second voice signals comprising synthesized voice signals that correspond to text.

15. The apparatus as recited in Claim 1 wherein the logic that provides the personality selects a smooth hand-off prompt to provide a smooth hand-off between the first voice signals and second voice

signals, the second voice signals being output by the logic that provides the voice user interface.

16. The apparatus as recited in Claim 15 wherein the logic that provides the personality selects a first complete sentence for output by the first voice signals and a second complete sentence for output by the second voice signals.

17. The apparatus as recited in Claim 16 wherein the first voice signals comprise the voice of a virtual assistant, and the second voice signals comprise the voice of a helper to the virtual assistant.

18. The apparatus as recited in Claim 17 wherein the second voice signals comprise recorded voice signals.

19. The apparatus as recited in Claim 17 wherein the second voice signals comprise synthesized voice signals.

polite and socially appropriate while interacting with the voice user interface with personality.

24. The apparatus as recited in Claim 1 wherein the logic that provides the personality comprises controlling the voice user interface in situations in which negative comments are needed.

25. The apparatus as recited in Claim 24 wherein the logic that provides the personality comprises selecting a negative prompt, the negative prompt comprising a concise and plain statement of a problem without blaming a user, and outputting a recording of the brief negative prompt at a lower volume.

26. The apparatus as recited in Claim 1 wherein the logic that provides the personality comprises selecting a prompt based on a user's experience with using the voice user interface during a current session and across sessions.

27. The apparatus as recited in Claim 26 wherein the logic that provides the personality comprises

selecting a shorter prompt based on the user's experience with using the voice user interface during the current session and across sessions.

28. The apparatus as recited in Claim 26 wherein the logic that provides the personality comprises selecting a longer help prompt if the user's input indicates a problem with increasing frequency during the current session and across sessions.

29. The apparatus as recited in Claim 26 wherein the logic that provides the personality comprises selecting a prompt that provides the available options to the user if the voice user interface does not recognize a command spoken by the user or if the user has not spoken for a defined period of time.

30. The apparatus as recited in Claim 26 wherein the logic that provides the personality comprises selecting a coaching prompt that provides a current state of interaction, provides commands that the user can say at the current state of interaction, and

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provides the actions that would be taken in response to each of the commands.

31. The apparatus as recited in Claim 1 wherein the logic that provides the personality comprises selecting an approximation prompt.

32. The apparatus as recited in Claim 1 wherein the logic that provides the personality comprises providing the voice user interface with a first personality and a second personality.

33. The apparatus as recited in Claim 32 wherein the first voice signals comprise the voice of the first personality, and second voice signals comprise the voice of the second personality.

34. The apparatus as recited in Claim 32 wherein a first virtual assistant comprises the first personality, and a second virtual assistant comprises the second personality.

35. The apparatus as recited in Claim 34 wherein the first virtual assistant and the second virtual assistant comprise different genders.

36. The apparatus as recited in Claim 34 wherein a user selects the first virtual assistant or the second virtual assistant based on descriptions of the first virtual assistant and the second virtual assistant or based on interacting with the first virtual assistant and the second virtual assistant.

37. The apparatus as recited in Claim 1 wherein the logic that provides the personality comprises selecting a humorous prompt.

38. The apparatus as recited in Claim 1 wherein the voice user interface with personality comprises a virtual assistant for a voice-based desktop environment.

39. The apparatus as recited in Claim 38 wherein the desktop environment comprises multiple objects, the

virtual assistant being navigated among the multiple objects by a user.

40. The apparatus as recited in Claim 1 further comprising:

a recognition grammar stored in a memory, the recognition grammar comprising multiple phrases that a virtual assistant with a personality can recognize when spoken by a user, and the recognition grammar being selected based on the personality of the virtual assistant.

41. The apparatus as recited in Claim 2 wherein the computer system comprises:

a telephone line card in communication with a telephone line for receiving speech input data from a user and speech output data from the logic that provides the voice user interface.

42. The apparatus as recited in Claim 41 wherein the computer system further comprises:

a network card, the network card in communication with a network.

43. The apparatus as recited in Claim 1 wherein the logic that provides the voice user interface comprises:

echo cancellation software, barge-in software, signal processing software, automatic speech recognition/natural language software, request for services software, and text-to-speech/recorded speech software.

44. A method for a voice user interface with personality, the method comprising:

executing a voice user interface, the voice user interface outputting first voice signals, the voice user interface recognizing speech signals; and

controlling the voice user interface to provide the voice user interface with a personality.

45. The method as recited in Claim 44 wherein the voice user interface with personality comprises computer software stored in a memory of a computer

system, the computer software being executed on a processor of the computer system.

46. The method as recited in Claim 44 wherein the voice user interface with personality comprises a virtual assistant with personality.

47. The method as recited in Claim 46 wherein the personality of the virtual assistant comprises a predetermined tone or cadence, a predetermined vocabulary, a predetermined sentence construction, or a predetermined degree of assertiveness.

48. The method as recited in Claim 44 wherein the first voice signals comprise a prompt, the prompt being scripted for the personality of the voice user interface.

49. The method as recited in Claim 44 wherein the first voice signals comprise a recorded prompt, the recorded prompt being acted and recorded for the personality of the voice user interface.

50. The method as recited in Claim 44 wherein the controlling the voice user interface comprises randomly selecting a specific prompt that corresponds to a generic prompt.

51. The method as recited in Claim 44 wherein the controlling the voice user interface comprises selecting a prompt, the prompt comprising an appropriate temporal prompt.

52. The method as recited in Claim 44 wherein the controlling the voice user interface comprises selecting a prompt to respond to a user, the prompt comprising a term that was previously spoken by the user in a recognized command.

53. The method as recited in Claim 44 wherein the voice user interface comprises recognizing multiple spoken commands as a predetermined command.

54. The method as recited in Claim 44 wherein the voice user interface comprises generating second voice

signals, the second voice signals comprising synthesized voice signals that correspond to text.

55. The method as recited in Claim 44 wherein the controlling the voice user interface comprises selecting a smooth hand-off prompt that provides a smooth hand-off between the first voice signals and second voice signals, the second voice signals being output by the voice user interface.

56. The method as recited in Claim 55 wherein the controlling the voice user interface comprises selecting a first complete sentence for output by the first voice signals and a second complete sentence for output by the second voice signals.

57. The method as recited in Claim 56 wherein the first voice signals comprise the voice of a virtual assistant and the second voice signals comprise the voice of a helper to the virtual assistant.

58. The method as recited in Claim 57 wherein the second voice signals comprise recorded voice signals.

59. The method as recited in Claim 57 wherein the second voice signals comprise synthesized voice signals.

60. The method as recited in Claim 44 wherein the controlling the voice user interface comprises controlling the selection of the first voice signals output by the voice user interface such that the voice user interface behaves consistently with social and emotional norms, including politeness, while interacting with the user.

61. The method as recited in Claim 60 wherein the controlling the voice user interface comprises selecting a word that is within a recognition grammar to be output by the first voice signals.

62. The method as recited in Claim 60 wherein the controlling the voice user interface comprises controlling the selection of the first voice signals output by the voice user interface such that the voice

user interface addresses a user by a proper name of the user.

63. The method as recited in Claim 60 wherein the speech signals comprise user commands spoken politely.

64. The method as recited in Claim 44 wherein the controlling the voice user interface comprises controlling the voice user interface in situations in which negative comments are needed.

65. The method as recited in Claim 64 wherein the controlling the voice user interface comprises selecting a negative prompt, and outputting a recording of the negative prompt at a lower volume.

66. The method as recited in Claim 44 wherein the controlling the voice user interface comprises selecting a prompt based on a user's experience with using the voice user interface during a current session and across sessions.

67. The method as recited in Claim 66 wherein the controlling the voice user interface comprises selecting a shorter prompt based on the user's experience with using the voice user interface during the current session and across sessions.

68. The method as recited in Claim 66 wherein the controlling the voice user interface comprises selecting a longer help prompt if the user's input indicates a problem with increasing frequency during the current session and across sessions.

69. The method as recited in Claim 66 wherein the controlling the voice user interface comprises selecting a prompt that lists the available options to the user if the voice user interface does not recognize a command spoken by the user or if the user has not spoken for a defined period of time.

70. The method as recited in Claim 66 wherein the controlling the voice user interface comprises selecting a coaching prompt that provides a current state of interaction, lists commands that the user can

say at the current state of interaction, and lists the actions that would be taken in response to each of the commands.

71. The method as recited in Claim 44 wherein the controlling the voice user interface comprises selecting an approximation prompt.

72. The method as recited in Claim 44 wherein the controlling the voice user interface comprises providing the voice user interface with a first personality and a second personality.

73. The method as recited in Claim 72 wherein the first voice signals comprise the voice of the first personality, and second voice signals comprise the voice of the second personality.

74. The method as recited in Claim 72 wherein a first virtual assistant comprises the first personality, and a second virtual assistant comprises the second personality.

75. The method as recited in Claim 74 wherein the first virtual assistant and the second virtual assistant comprise different genders.

76. The method as recited in Claim 74 wherein a user selects the first virtual assistant or the second virtual assistant based on descriptions of the first virtual assistant and the second virtual assistant or based on interacting with the first virtual assistant and the second virtual assistant.

77. The method as recited in Claim 44 wherein the voice user interface with personality comprises selecting a humorous prompt.

78. The method as recited in Claim 44 wherein the voice user interface with personality comprises a virtual assistant for a voice-based desktop environment.

79. The method as recited in Claim 78 wherein the desktop environment comprises multiple objects, the

virtual assistant being navigated among the multiple objects by a user.

80. The method as recited in Claim 44 further comprising:

storing a recognition grammar in a memory, the recognition grammar comprising multiple phrases that the voice user interface can recognize when spoken by a user, and the grammar being selected based on the personality of the voice user interface.

81. The method as recited in Claim 44 wherein the voice user interface comprises:

echo cancellation software, barge-in software, signal processing software, automatic speech recognition/natural language software, request for services software, and text-to-speech/recorded speech software.

82. A data signal in a carrier wave for a voice user interface with personality, the data signal in a carrier wave comprising:

first voice signals, the first voice signals being output by a voice user interface with personality; and

speech signals, the voice user interface with personality recognizing the speech signals.

83. The data signal in a carrier wave as recited in Claim 82 wherein the first voice signals comprise a prompt, the prompt being scripted for the personality of the voice user interface.

84. The data signal in a carrier wave as recited in Claim 82 wherein the first voice signals comprise a recorded prompt, the recorded prompt being acted and recorded for the personality of the voice user interface.

85. The data signal in a carrier wave as recited in Claim 82 wherein the first voice signals comprise a prompt randomly selected from multiple prompts available to provide a predetermined response.

86. The data signal in a carrier wave as recited in Claim 82 wherein the first voice signals comprise a prompt, the prompt comprising an appropriate temporal prompt.

87. The data signal in a carrier wave as recited in Claim 82 wherein the first voice signals comprise a prompt to respond to a user, the prompt comprising a term that was previously spoken by the user in a recognized command.

88. The data signal in a carrier wave as recited in Claim 82 wherein the speech signals comprise a phrase, the phrase being recognized by the voice user interface with personality as a predetermined command.

89. The data signal in a carrier wave as recited in Claim 82 further comprising:

second voice signals, the second voice signals being output by the voice user interface with personality.

90. The data signal in a carrier wave as recited in Claim 89 further comprising:

third voice signals, the third voice signals being output by the voice user interface with personality, the third voice signals comprising a smooth hand-off between the first voice signals and the second voice signals.

91. The data signal in a carrier wave as recited in Claim 89 wherein the first voice signals comprise a first complete sentence and the second voice signals comprise a second complete sentence.

92. The data signal in a carrier wave as recited in Claim 89 wherein the first voice signals comprise the voice of a virtual assistant, and the second voice signals comprise the voice of a helper to the virtual assistant.

93. The data signal in a carrier wave as recited in Claim 89 wherein the second voice signals comprise synthesized voice signals.

94. The data signal in a carrier wave as recited in Claim 82 wherein the first voice signals comprise a word that is within a recognition grammar of the voice user interface with personality.

95. The data signal in a carrier wave as recited in Claim 82 wherein the first voice signals comprise a proper name of the user.

96. The data signal in a carrier wave as recited in Claim 82 wherein the first voice signals comprise a negative prompt, the negative prompt comprising a concise and plain statement of a problem without blaming a user, and the first voice signals being output at a lower volume.

97. The data signal in a carrier wave as recited in Claim 82 wherein the first voice signals comprise a prompt that is selected based on a user's experience with using the voice user interface with personality during a current session and across sessions.

98. The data signal in a carrier wave as recited in Claim 97 wherein the first voice signals comprise a longer help prompt if the user's input indicates a problem with increasing frequency during the current session and across sessions.

99. The data signal in a carrier wave as recited in Claim 82 wherein the first voice signals comprise a coaching prompt that provides a current state of interaction, lists commands that the user can say at the current state of interaction, and lists the actions that would be taken in response to each of the commands.

100. The data signal in a carrier wave as recited in Claim 82 wherein the first voice signals comprise an approximation prompt.

101. The data signal in a carrier wave as recited in Claim 82 wherein the voice user interface with personality comprises a first personality and a second personality.

102. The data signal in a carrier wave as recited in Claim 101 wherein the first voice signals comprise the voice of the first personality, and second voice signals comprise the voice of the second personality, the second voice signals being output by the voice user interface with personality.

103. The data signal in a carrier wave as recited in Claim 101 wherein a first virtual assistant comprises the first personality, and a second virtual assistant comprises the second personality.

104. The data signal in a carrier wave as recited in Claim 82 wherein the first voice signals comprise a humorous prompt.